SOME CIRCUM-PACIFIC SCHISTOCHILACEAE

Harvey A. Miller
University of Illinois, Urbana, Illinois 61801*

Shortly after I began studies on Hawaiian Hepaticae, a packet apparently collected by C. M. Cooke on Molokai was given me for inspection at the Bishop Museum. Someone had written "?fern" on the packet - an understandable query because the plant it contained was frond-like and even larger than some small Hawaiian ferns. It belonged in the Schistochilaceae but was quite unlike any I had seen to that time. More recently, while preparing manuals for Hawaii and Micronesia, I have reviewed Schistochila again in relation to Pacific Island collections and have concluded that I have at least three well defined groups of species which can be appropriately recognized as distinctive, though related, genera. Accordingly, two genera which do not come to Schistochila appendiculata, the generitype, are proposed. Further study on a monographic basis may result in additional segregates within the Schistochilaceae.

The family Schistochilaceae, as recognized in recent publications, contains two genera, Schistochila and Schuster's (1963) recently described monotypic Paraschistochila. The genus Schistochila was described by Dumortier in 1835 with 5 species assigned to the genus - nobilis, lamellata, appendiculata, pinnatifolia, and thouarsii. Subsequently, Nees von Esenbeck (1844 in Gottsche, et. al) described Gottschea for the same species, and more, in the Synopsis Hepaticarum having overlooked Dumortier's Schistochila. A list and descriptions for 17 species accompanied the generic description of Gottschea in the Synopsis including all 5 species cited by Dumortier. As the concept was clearly the same for both Schistochila and Gottschea, it would seem advisable to name G. appendiculata (= Jungermannia appendiculata Hook.) as the lectotype so that the synonomy is unambiguous - but, unfortunately, this lovely escape is not open to us.

Montagne (1843) accepted the name Gottschea which had not yet appeared in the first part of the Synopsis Hepaticarum and rejected his own manuscript name of Notopterygium in favor of Nees' proposal to honor Gottsche. The first published description of Gottschea as a genus is that prepared by Montagne who credited only the name to

---

*After September 1, Florida Technological University, Orlando, Florida 32816

Nees. Thus, the credit for the name and the citation must become:

Gottschea Nees ex Mont. Ann. Sci. Nat. Bot. 2,19: 245. 1843.

As the species cited are G. hombroniana, G. philippinensis, G. neesii and G. thouarsii, the lectotype for the genus must come from these. Therefore, in order to preserve the sense of Gottschea as closely as possible to that of Schistochila, the most appropriate lectotype is G. hombroniana Mont. This species is considered by many authors to be synonymous with Schistochila lehmanniana (Lindenb. in Lehm.) Steph. but, in any event, it does not affect the typification of Gottschea just proposed.

The general nature of the Schistochila-Gottschea name problem has been recognized since S. O. Lindberg's (1873) publication of his discovery of the long-overlooked Dumortier papers. Four years later, Trevisan (1877) called attention to Colla's (1836) genus Notarisia based on N. lycopodioides from "ins. Iuan Fernandez" and placed by Colla close to Lycopodium, apparently on account of misinterpretation of antheridia as sporangia. Trevisan brought a mixture of species to Notarisia but the genus was not accepted by subsequent workers (e.g., Schiffner, 1893-95), and was relegated to synonomy under Schistochila. Despite the relative antiquity of the specific epithet, it seems to have gotten lost and does not appear in either the Species Hepaticarum or in Herzog's report on the foliose Hepaticae of Juan Fernandez and Easter Islands. As underleaves are present according to the description, a new combination is required as follows:

Schistochila lycopodioides (Colla) H. A. Miller, comb. nov.
Notarisia lycopodioides Colla. Mem. R. Accad. Sci. Torino 1,39: 53; Tab. 75, fig. 2. 1836.

A review of the original species of Schistochila reflects the redefinitions within the family: 1) S. nobilis remains in the genus; 2) S. appendiculata is the lectotype for the genus (Grolle, 1966); 3) S. thouarsii was placed by Stephani under Schistochila sphagnoides; 4) S. lamellata goes to Fulfordistria gen. nov. along with 6 other species; and 5) S. pinnatifolia (= S. pinnatifida Mont. p. 243. 1843. lapsus) is the type for Paraschistochila.

Key to Genera of Schistochilaceae

1. Plants with amphigastria much wider than the stem-------2
1. Plants lacking amphigastria or, if present, vestigial and narrower than the stem----------3

2. Leaves and sometimes underleaves distinctly lamellate with more or less parallel, unistratose, lamellae up to several cells high on the surface----------Fulfordistria
2. Leaves plane without longitudinal lamellae----------Schistochila

3. Leaves with both segments distinctly lobed as well as toothed----------Paraschistochila
3. Leaves entire or variously ornamented, but not distally lobed----------Schistochilaster

SCHISTOCHILASTER, H. A. Miller, gen. nov.

Schistochila Dum. affine, a quo amphigastriis nullis vel rudimentariis differt. Folia caulina inaequaliter bilobata, simpliciter alata; lobus dorsalis integer vel apice solum fimbriatus; et lobus ventralis sine lamellis. Typus: Jungermannia aligera Nees.

The distinctiveness of this taxon was implied as long ago as 1844 in the Synopsis Hepaticarum. Except for Paraschistochila pinnatifolia, Schistochilaster includes all species in the family which lack underleaves or, more often, possess few-celled, vestigial, amphigastria narrower than the stem. In Schistochila, s. str., underleaves are broader than the stem and often elaborately ornamented as well. Emphasis has been placed on the gametophytic characters for the present because the species are mostly little known except for a few, often imperfect, herbarium specimens. Species which are transferred to this genus include:

1. Schistochilaster aligeraeforme (de Not.) comb. nov.
   Gottschea aligeraeformis de Not. Mem. R. Accad. Sci. Torino 2, 28: 272. 1876.
   Schistochila aligeraeformis (de Not.) Schiffn. Conspect. Hep. Arch. Ind. p. 213. 1898.

2. Schistochilaster aligerum (Nees) comb. nov.
Jungermannia aligera Nees. Nova. Acta. Acad. Leop.-Carol. 11: 135. 1823.
Gottschea aligera (Nees) Nees in GLN. Syn. Hep. 17. 1844.
Notarisia aligera (Nees) Trevis. Mem. R. Ist. Lombardo, Ser. 3, 4: 392. 1877.
Schistocheila (sic!) aligera (Nees) Jack & Steph. Hedwigia 31: 12. 1892.

3. Schistochilaster brotheri (Steph.) comb. nov.
Schistochila brotheri Steph. Spec. Hep. 4: 85. 1909.

4. Schistochilaster cheesmanii (Steph.) comb. nov.
Schistochila chessmani Steph. Spec. Hep. 4: 96. 1909.

5. Schistochilaster colensoanum (Steph.) comb. nov.
Schistochila colensoana Steph. Spec. Hep. 4: 87. 1909.

6. Schistochilaster conchophyllum (Hodgs. & Allison) comb. nov.
Schistophylla (lapsus pro Schistochila) conchophylla Hodgs. & Allison. Trans. Proc. Roy. Soc. New Zealand 71: 191. 1941.

7. Schistochilaster curtisii (Steph.) comb. nov.
Schistochila curtisii Steph. Spec. Hep. 4: 77. 1909.

8. Schistochilaster cuspidilobum (Steph.) comb. nov.
Schistochila cuspidiloba Steph. Spec. Hep. 4: 82. 1909.

9. Schistochilaster englerianum (Steph.) comb. nov.
Schistochila engleriana Steph. Spec. Hep. 4: 69. 1909.

No specimen is cited for this species in the Species Hepaticarum but it is listed under Africa. The specimen sketched in the Icones Ineditae from which the description was written is "Usambara, Kovai 2600 m, A. Engler."

10. Schistochilaster fleischeri (Steph.) comb. nov.
Schistochila fleischeri Steph. Spec. Hep. 4: 81. 1909.

11. Schistochilaster fragile (Steph.) comb. nov.
Schistochila fragilis Steph. Spec. Hep. 4: 84. 1909.

12. Schistochilaster graeffeanum (Jack & Steph.) comb. nov.
Schistocheila (sic!) (Gottschea) graeffeana Jack & Steph. Bot. Centralbl. 60: 97. 1894.

13. Schistochilaster integerrimum (Steph.) comb. nov.
Schistochila integerrima Steph. Spec. Hep. 6: 492. 1924.

14. Schistochilaster laceratum (Steph.) comb. nov.
Schistochila lacerata Steph. Spec. Hep. 6: 492. 1924.

15. Schistochilaster linearifolium (Jack & Steph.) comb. nov.
Schistocheila (sic!) linearifolium Jack & Steph. Bot. Centralbl. 60: 98. 1894.

16. Schistochilaster maximum (Steph.) comb. nov.
Schistochila maxima Steph. Spec. Hep. 6: 493. 1924.

17. Schistochilaster neesii (Mont.) comb. nov.
Gottschea neesii Mont. Ann. Sci. Nat. Bot. Ser. 2, 19: 244. 1843.
Schistochila neesii (Mont.) S.O. Lindb. J. Linn. Soc. Bot. 13: 194. 1873.

18. Schistochilaster philippinense (Mont.) comb. nov.
Gottschea philippinensis Mont. Ann. Sci. Nat. Bot. Ser. 2, 19: 244. 1843.
Notarisia philippinensis (Mont.) Trevis. Mem. R. Ist. Lombardo, Ser. 3, 4: 392. 1877.
Schistocheila (sic!) philippinensis (Mont.) Jack & Steph. Bot. Centralbl. 60: 98. 1894.
Schistochila commutata Steph. Spec. Hep. 4: 74. 1909. (fide Buch, 1939).
Schistochila sumatrana Steph. Spec. Hep. 4: 74. 1909. (fide Buch, 1939).
Schistochila confertifolia Steph. Spec. Hep. 4: 75. 1909. (fide Grolle, 1966).
Schistochila lauterbachii Steph. in Lauterbach & Schumann, Flora Deutsch. Schutzgeb. Südsee: 72. 1901. nomen nudum. (fide Grolle, 1966).

Older varietal names and mis-identifications applied to this species are listed by Buch.

19. Schistochilaster piligerum (Steph.) comb. nov.
Schistocheila (sic!) piligera Steph. Hedwigia 31: 213. 1892.

20. Schistochilaster spegazzinianum (Massal.) comb. nov.
Gottschea spegazziniana Massal. Nuovo Giorn. Bot. Ital. 17: 206. 1885.
Schistochila spegazziniana (Massal.) Steph. Spec. Hep. 4: 99. 1910.

21. Schistochilaster spinosum (Steph.) comb. nov.
Schistochila spinosa Steph. Spec. Hep. 6: 495. 1924.

22. Schistochilaster truncatilobum (Steph.) comb. nov.
Schistochila truncatiloba Steph. Denks. Math.-Naturwiss. Kl. K. Akad. Wissensch. Wien 88: 34. 1911.

23. Schistochilaster tuloides (Tayl.) comb. nov.
Jungermannia tuloides Tayl. London J. Bot. 3: 558. 1844.
Gottschea tuloides (Tayl.) GLN. Syn. Hep. 620. 1846.
Schistochila tuloides (Tayl.) Steph. Spec. Hep. 4: 89. 1909.
Gottschea ramulosa Colenso. Trans. New Zealand Inst. 18: 243. 1885.
Schistochila ramulosa (Colenso) Steph. Spec. Hep. 4: 92. 1909. (fide Hodgson, 1941).
Gottschea homophylla Colenso. Trans. New Zealand Inst. 20: 250. 1887.
Schistochila homophylla (Colenso) Hodgs. Trans. Proc. Roy. Soc. New Zealand 71: 194. 1941. (fide Hodgson, 1941).

24. Schistochilaster viride (Steph.) comb. nov.
Schistochila viridis Steph. Spec. Hep. 6: 496. 1924.

FULFORDISTRIA, H. A. Miller, gen. nov.

Schistochila Dum. affine, a quo foliis cum lamellis parallelis superficiaribus differt. Amphigastria latiora quam caulis. Typus: Jungermannia lamellata Hook.

It is a pleasure to name this most distinctive Antarctic-Pacific genus in honor of Professor Margaret Hannah Fulford who has contributed so significantly to our knowledge of Fuegian Hepaticae. The rows of conspicuous, multicellular, toothed lamellae are a most striking feature even under low magnifications. Species transferred to the genus are:

1. Fulfordistria cookei H. A. Miller, sp. nov.
Fulfordistria lamellata similis, sed amphigastriis late ovatis et non profunde bifidis vel aliquoties segmentatis. Specimen typicum in insula Molokai, in insulis Hawaiianis, legit C. M. Cooke, Jr., 1903, in hb BISH. (Fig. 1)

2. Fulfordistria glaucescens (Hook.) comb. nov.
Jungermannia glaucescens Hook. Musci Exotici tab. 39. 1818.
Gottschea glaucescens (Hook.) Nees in GLN. Syn. Hep. 20. 1844.
Schistochila glaucescens (Hook.) Steph. Spec. Hep. 4: 92. 1909.

3. Fulfordistria lamellata (Hook.) comb. nov.
Jungermannia lamellata Hook. Musci Exotici tab. 49. 1818.
Schistochila lamellata (Hook.) Dum. Rec. d'Obs. 15. 1835.
Gottschea lamellata (Hook.) Nees in GLN. Syn. Hep. 20. 1844.

4. Fulfordistria lamellistipula (Steph.) comb. nov.
Schistochila lamellistipula Steph. Spec. Hep. 4: 94. 1909.

5. Fulfordistria laminigera (Tayl.) comb. nov.
Jungermannia laminigera Tayl. London J. Bot. 3: 456. 1844.
Gottschea laminigera (Tayl.) GLN. Syn. Hep. 623. 1846.
Schistochila laminigera (Tayl.) Schiffn. in Engler & Prantl. Natürl. Pfl.-fam. 1, 3: 111. 1895.

6. Fulfordistria reicheana (Steph.) comb. nov.
Schistochila reicheana Steph. Spec. Hep. 4: 95. 1909.

7. Fulfordistria savatieri (Steph.) comb. nov.
Schistochila savatieri Steph. Spec. Hep. 4: 94. 1909.

Financial support of field studies related to this report was provided by the National Science Foundation grants to Miami University under GB-1236 and GF-176 of the U.S.-Japan Co-operative Science Program.

LITERATURE CITED

Buch, H. 1939. Die Schistochila-Arten der Inseln Sumatra, Java und Celebes. Ann. Bryol. 12: 1-20.

Colla, A. 1836. Plantae rariores in regionibus chilensibus a clarissimo M.D. Bertero. Mem. Reale Accad. Sci. Torino 39: 1-55. 75 pl.

Dumortier, B.C. 1835. Recueil d'Observations sur les Jungermanniacées. 27 p. Tournay.

Gottsche, C.M., J.B.G. Lindenberg, and C.G. Nees ab Esenbeck. 1844-47. Synopsis Hepaticarum. 835 p. Hamburg.

Grolle, R. 1965. Die Lebermoosgattungen Blepharidophyllum Ångstr. und Krunodiplophyllum nov. gen. (Scapaniaceae). J. Hattori Bot. Lab. 28: 55-74.

_____. 1966. Lebermoose aus Neuguinea. 4. Schistochila. J. Hattori Bot. Lab. 29: 238-252.

Herzog, T. 1942. Die foliosen Lebermoose. In Skottsberg, The natural history of Juan Fernandez and Easter Island 2: 697-752.

Hodgson, E. Amy. 1941. Review of the New Zealand species of Schistochila, with notes on Colenso's species. Trans. Proc. Roy. Soc. New Zealand. 71: 181-194.

Lindberg, S.O. 1873. On Zoopsis, H. f. & T. J. Linn. Soc. Bot. 13: 188-203.

Montagne, C. 1843. Quatrième centurie de plantes cellulaires exotiques nouvelles. Décades I-VI. Ann. Sci. Nat. Bot. 19: 238-266. pl. 9.

Schiffner, V.F. 1893-95. Hepaticae. In Engler & Prantl, Die Natürl. Pfl.-fam. 1(3): 3-141.

Schuster, R.M. 1963. Studies on Antipodal Hepaticae with special reference to New Zealand and Tasmania. J. Hattori Bot. Lab. 26: 185-309.

_____. 1968. Studies on Antipodal Hepaticae X. Subantarctic Scapaniaceae, Balantiopsidaceae and Schistochilaceae. Bull. Nat. Sci. Mus. Tokyo 11: 13-31.

Trevisan, V. 1877. Schema di una nuova classificazione delle Epatiche. Mem. R. Ist. Lombardo Sci. Lett. 3, 4: 383-451.

Explanation of Figure 1

Fulfordistria cookei H.A. Miller. a. Habit sketch, X3; b. Underleaf, X16; c. Leaf, X16; d. Cells of the antical leaf margin, X480; e. Cells of the middle of the blade, X480. Drawn from the type specimen.

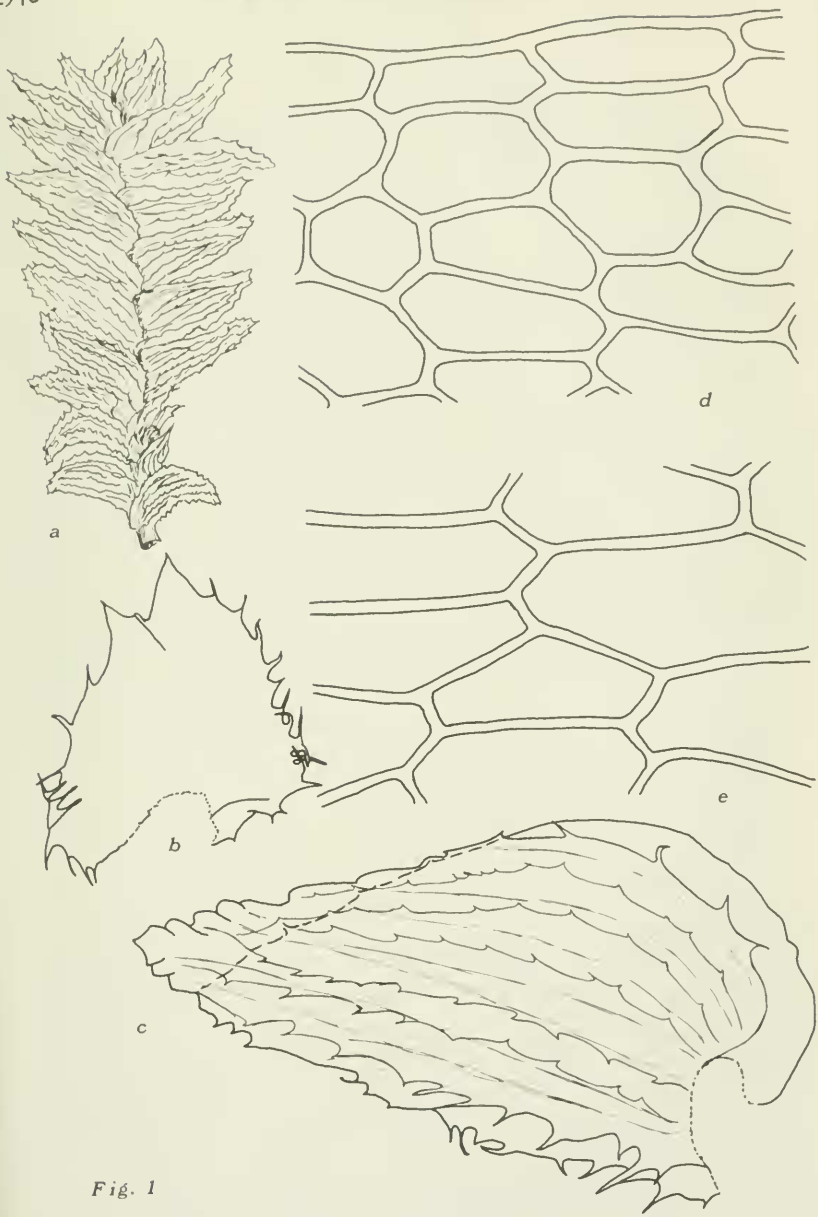

Fig. 1